What is claimed is:

1. A method for allocating to transmitting devices a stream of complex symbols for transmission in parallel by the transmitting devices, the stream including replications that, for at least some of the symbols, include at least one of a complex conjugate and a negative complex conjugate of the symbol, the parallel transmission being temporally divided into time slots, the time slots being temporally divided into symbol periods each time slot having respective first and second portions, said method comprising:

allocating the stream to the transmitting devices and to the symbol periods so that, for at least one of said slots, the symbols in at least one symbol period in the first portion of the at least one slot have at least one of complex conjugate and negative complex conjugate representations in at least one symbol period in the second portion of the at least one slot, said representations and corresponding symbols defining a non-orthogonal-based matrix having dimensions that represent transmitting devices and symbol periods, respectively, said non-orthogonal-based matrix having, as its constituents, orthogonal-based matrices; and

transmitting, from the transmitting devices, in parallel and in accordance with said allocating to the devices and the periods, signals having characteristics that are represented by the complex symbols in the allocated stream.

2. The method of claim 1, wherein the symbol periods in the first portion of the at least one slot temporally precede the symbol periods in the second portion of the at least one slot.

3. The method of claim 1, wherein the at least one symbol period in the first portion and the at least one symbol period in the second portion both comprise multiple symbol periods.

4. The method of claim 1 wherein, for the at least one slot, at least one pilot symbol separates the first portion from the second portion, the at least one pilot symbol being usable by a receiver in estimating a characteristic of a channel between at least one of the transmitting devices and a receiver.

5. The method of claim 1, wherein the at least one symbol period in the first portion is a single symbol period and the at least one symbol period in the second portion is a single symbol period.

6. The method of claim 1, wherein the time slots are configured to be small enough so that transmission quality is substantially constant during a time slot.

7. The method of claim 1, wherein at least one of the orthogonal-based matrices is a 2 by 2 matrix that defines a configuration in which one transmitting device transmits one symbol in one symbol period, another transmitting device transmits another symbol in the one symbol period, and in a subsequent symbol period the one transmitting device transmits a complex conjugate of the another symbol.

8. The method of claim 1, wherein the constituent orthogonal-based matrices comprise at least two orthogonal-based matrices that, when combined, entry-to-entry, by a mathematical operation produce the non-orthogonal-based matrix.

9. The method of claim 8, wherein the mathematical operation is at least one of addition, subtraction, multiplication and division.

10. The method of claim 8, wherein the mathematical operation adds, for at least one entry, respective symbols of the at least two matrices, the respective symbols being designed for operation under respective complex modulation schemes, at least two of the modulation schemes differing as to the respective set of points in the complex plane to which signals are mapped so that no point in one set coincides with any point in the other set.

11. The method of claim 1, wherein the stream is formed from an incoming stream having a temporal order, the at least one time slot comprising multiple time slots, the symbols in the orthogonal-based matrices defining the orthogonal-based matrices of the multiple time slots in a temporal sequence in accordance with a temporal order of the symbols in the incoming stream.

12. The method of claim 11, wherein the constituent orthogonal-based matrices comprise at least two orthogonal-based matrices that are consecutive in the temporal sequence and that, when combined, entry-to-entry, by a mathematical operation produce the non-orthogonal-based matrix.

13. The method of claim 11, wherein the temporal sequence of the orthogonal-based matrix constituents of the non-orthogonal-based matrices of the multiple time slots defines a temporal order of the non-orthogonal-based matrices of the multiple time slots, at least one of

the multiple time slots comprising a nesting, in a temporal order, of ones of the temporally ordered non-orthogonal-based matrices.

14. The method of claim 13, wherein the temporal order of the nesting corresponds to the temporal order of the incoming stream.

15. The method of claim 14, wherein the nesting converges around at least one pilot symbol that is used by a receiver for estimating a characteristic of a channel between the receiver and at least one of the transmitting devices.

16. The method of claim 11, wherein the constituents comprise consecutive ones of the orthogonal-based-matrices in the temporal sequence, the consecutive orthogonal-based matrices having respective transmitting device dimensions, and the non-orthogonal-based matrix having a transmitting device dimension that is equal to a sum of the respective transmitting device dimensions of the consecutive orthogonal-based matrices.

17. The method of claim 16, wherein at least one pair of consecutive orthogonal-based matrices of the consecutive constituents of respective non-orthogonal-based matrices is arranged within the respective non-orthogonal-based matrix in a checkerboard pattern, each of the at least one pair comprising a member and an other member, whereby each member of the pair is diagonally adjacent to a copy of itself, horizontally adjacent to at least one copy of the other member, and vertically adjacent to at least one copy of the other member.

18. The method of claim 1, wherein the representations and corresponding symbols that define a non-orthogonal-based matrix are separated by at least one symbol period.

19. The method of claim 1, wherein the stream is formed from an incoming stream that has a temporal order, one of the representations and the corresponding symbols that define a non-orthogonal-based matrix being arranged in accordance with said temporal order and the other of the representations and corresponding symbols being arranged in accordance with a reverse of said temporal order.

20. An apparatus for allocating complex symbols for parallel transmission, the parallel transmission being temporally divided into time slots, the time slots being divided into symbol periods and each time slot having respective first and second portions, the apparatus comprising:

at least two transmitting devices; and

a symbol allocating module for allocating the complex symbols to the symbol periods and to the transmitting devices so that, for at least one of the time slots, the symbols in at least one symbol period in the first portion of the at least one time slot have at least one of complex conjugate and negative complex conjugate representations in at least one symbol period in the second portion of the at least one time slot, the representations and corresponding symbols constituting a non-orthogonal-based matrix having dimensions that represent transmitting devices and symbol periods, respectively, said non-orthogonal matrix having, as its constituents, orthogonal-based matrices, the transmitting devices receiving the allocated complex symbols and transmitting, in parallel and in accordance with said allocating to the periods and the devices, signals having characteristics that are represented by the allocated complex symbols.

21. The apparatus of claim 20, wherein the apparatus comprises a base station in a wireless mobile communication system.

22. The apparatus of claim 20, wherein the apparatus comprises a mobile terminal.

23. The apparatus of claim 22, wherein the apparatus comprises a mobile phone.

24. The apparatus of claim 20, wherein the constituent orthogonal-based matrices comprise at least two orthogonal-based matrices that, when combined, entry-to-entry, by a mathematical operation produce the non-orthogonal-based matrix.

25. The apparatus of claim 24, wherein the mathematical operation adds, for at least one entry, respective symbols of the at least two matrices, the respective symbols being designed for operation under respective complex modulation schemes, at least two of the modulation schemes differing as to the respective set of points in the complex plane to which signals are mapped.

26. The apparatus of claim 25, the differing being such that no point in one set coincides with any point in the other set.

27. The apparatus of claim 20, wherein the stream is formed from an incoming stream having a temporal order, the at least one time slot comprising multiple slots, and the symbols in the orthogonal-based matrices defining the orthogonal-based matrices of the

multiple slots in a temporal sequence in accordance with a temporal order of the symbols in the incoming stream.

28. The apparatus of claim 27, wherein the constituent orthogonal-based matrices comprise at least two orthogonal-based matrices that are consecutive in the temporal sequence and that, when combined, entry-to-entry, by a mathematical operation produce the non-orthogonal-based matrix.

29. The apparatus of claim 27, wherein the temporal sequence of the orthogonal-based matrix constituents of the non-orthogonal-based matrices of the multiple time slots defines a temporal order of the non-orthogonal-based matrices of the multiple time slots, and at least one of the multiple time slots comprising a nesting, in a temporal order, of ones of the temporally ordered non-orthogonal-based matrices.

30. The apparatus of claim 27, wherein the constituents comprise consecutive ones of the orthogonal-based-matrices in the temporal sequence, the consecutive orthogonal-based matrices having respective transmitting device dimensions, and the non-orthogonal-based matrix having a transmitting device dimension that is equal to a sum of the respective transmitting device dimensions of the consecutive orthogonal-based matrices.

31. The apparatus of claim 30, wherein at least one pair of consecutive orthogonal-based matrices of the consecutive constituents of respective non-orthogonal-based matrices is arranged within the respective non-orthogonal-based matrix in a checkerboard pattern, each of the at least one pair comprising a member and an other member, and whereby

each member of the pair is diagonally adjacent to a copy of itself, horizontally adjacent to at least one copy of the other member, and vertically adjacent to at least one copy of the other member.

32. The apparatus of claim 20, wherein the stream is formed from an incoming stream that has a temporal order, one of the representations and the corresponding symbols that constitute a non-orthogonal-based matrix being arranged in accordance with said temporal order and the other of the representations and corresponding symbols being arranged in accordance with a reverse of said temporal order.

33. The apparatus of claim 20, wherein the symbol periods in the first portion of the at least one time slot temporally precede the symbol periods in the second portion of the at least one time slot.

34. The apparatus of claim 20, wherein the at least one symbol period in the first portion and the at least one symbol period in the second portion both comprise multiple symbol periods.

35. The apparatus of claim 20 wherein, for the at least one time slot, at least one pilot symbol separates the first portion from the second portion, the at least one pilot symbol being usable by a receiver in estimating a characteristic of a channel between at least one of the transmitting devices and a receiver.

36. The apparatus of claim 20, wherein the at least one symbol period in the first portion is a single symbol period and the at least one symbol period in the second portion is a single symbol period.

37. The apparatus of claim 20, wherein the time slots are configured to be small enough so that transmission quality is substantially constant during a slot.

38. A computer program for allocating to transmitting devices a stream of complex symbols for transmission in parallel by the transmitting devices, the stream including replications that, for at least some of the symbols, include at least one of a complex conjugate and a negative complex conjugate of the symbol, the parallel transmission being temporally divided into time slots, and the time slots being temporally divided into symbol periods and each time slot having respective first and second portions, the method comprising:

instruction means for allocating the stream to the symbol periods and to said transmitting devices so that, for at least one of said time slots, the symbols in at least one symbol period in the first portion of the at least one time slot have at least one of complex conjugate and negative complex conjugate representations in at least one symbol period in the second portion of the at least one time slot, the representations and corresponding symbols defining a non-orthogonal-based matrix having dimensions that represent transmitting devices and symbol periods, respectively, and the non-orthogonal matrix having, as its constituents, orthogonal-based matrices; and

instruction means for receiving the allocated stream and for generating for transmission, in parallel and in accordance with said allocating to the periods and the devices, signals having characteristics that represent the complex symbols in the allocated stream.

39. The computer program of claim 38, wherein the constituent orthogonal-based matrices comprise at least two orthogonal-based matrices that, when combined, entry-to-entry, by a mathematical operation produce the non-orthogonal-based matrix.

40. The computer program of claim 38, wherein the stream is formed from an incoming stream having a temporal order, the at least one time slot comprising multiple slots, the symbols in the orthogonal-based matrices defining the orthogonal-based matrices of the multiple time slots in a temporal sequence in accordance with a temporal order of the symbols in the incoming stream, the constituents comprising consecutive ones of the orthogonal-based-matrices in the temporal sequence, the consecutive orthogonal-based matrices having respective transmitting device dimensions, and the non-orthogonal-based matrix having a transmitting device dimension that is equal to a sum of the respective transmitting device dimensions of the consecutive orthogonal-based matrices.